GrummanWorld

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Navy Sold On New Grumman F-14A+ Tomcat

CALVERTON, L.I. November 16, 1987 — The U.S. Navy accepted its first F-14A+ at the roll-out ceremony which drew over 400 people here today. It is the first Tomcat delivered since March of this year, when Grumman changed over its production line to the F-14A+. These Tomcats feature new, powerful General Electric engines.

"We're particularly proud of this version," said Grumman Chairman Jack Bierwirth. "Some products become embedded in a company's identity. The F-14 is our public image."

Grumman will build 38 production F-14A+ fighters through February of 1990. It will also retrofit 32 F-14A's with the new engines and several new avionics systems. The engines give the plane 30 percent more thrust than the original Pratt and Whitney powerplants in the "A" version. The retrofit project has already begun. The first delivery of those modified planes will be in May of next year. The modification work will end December 1989.

The F-14A+ aircraft is an interim design until the new F-14D, with its advanced radar and weapon systems, is delivered in early 1990.

Speaking at the acceptance ceremony were U.S. Senator Pat Moynihan (D-N.Y.); U.S. Representative Sam Stratton (D-N.Y.); Vice Adm. Robert Dunn, deputy chief of Naval Operations for Air Warfare; Rear Adm. William Bowes, former Navy F-14 program manager; and Grumman Aircraft Systems President Renso Caporali.

"This was truly a magnificent development and production effort that only a great aerospace company could have accomplished," said Adm. Bowes.

Adm. Dunn called incremental improvements — the addition of new capabilities to proven aircraft design — the way to stay dominant in the skies.

"To control the sea, you must dominate the air above the sea," said Adm. Dunn. "Nothing takes the place of a strong, capable, agile, user-friendly aircraft. The best in the world is the F-14 Tomcat, bar none. You have given us an even better fighter."

Senator Moynihan stressed that American foreign policy is dependent on the strength of carrier battle groups, particularly today in the Persian Gulf. "Our foreign policy is made possible by this technology. You do so much more than you may think," said the senator.

Rep. Stratton serves as chairman of the House Armed Services Committee's subcommittee on procurement. "The membership of the entire committee recognized the advantage that the F-14A+ represented for the Navy and that is what we are saluting here today," said the congressman.

Standing in front of the new F-14A+ Tomcat, Aircraft Systems President Renso Caporali told the audience, "That old Tomcat back there truly keeps getting better."■

First Of Many. *(Above) Chairman Jack Bierwirth spoke at the F-14A+ ceremony on November 16. On the dais were (L to R): Rep. George Hochbrueckner, Aircraft Systems President Renso Caporali, Rep. Bob Mrazek, Rep. Norman Lent, Vice Adm. Robert Dunn, Rep. Sam Stratton, and Sen. Pat Moynihan. Also attending were Grumman President John O'Brien, Acting Asst. Navy Secretary Richard Rumpf, Rear Adm. William Bowes, Capt. Wendell Brown, Capt. John Snyder and Lt. Cmdr. Robert Rodriguez. At left, Caporali and Bierwirth during press conference. (Photos by Karl Thoma)*

Away She Goes

On Saturday, November 14, Grumman chief test pilot Kurt Schroeder and backseater Ed Flanagan took the first production F-14A+ Tomcat on its maiden flight. During the one hour and 24 minute flight, the F-14A+ flew at 1.4 Mach True and reached an altitude of 35,000 feet.

With the new General Electric engines, the F-14A+ can climb and accelerate faster. The Tomcat can also spend more time on combat area patrol. There are no throttle restrictions, and the pilot doesn't have to use the afterburners for catapult launches. These engines will also power the F-14D when it debuts in 1990.

Eventually, the Navy will receive 70 F-14A+'s. Thirty-eight of them will be new production aircraft; 32 will be retrofitted F-14A's.

What's Inside

Telephone Dialing Changes Dec. 28 - Page 2

DCO And The New Tax Law - Page 3

Talking About Work - Page 4

Dealing With The Hassles Of Business Travel - Page 5

Tachonics Taking Bigger Bites Out Of Market - Page 6

Service Milestones - Page 8

Holiday Shopping At ESO - Page 10

Great Decisions '88 - Page 11

New Phone Dialing System Begins Ringing December 28

The holidays are coming. One gift will be waiting for you when you return from the year-end holiday break: a new telephone book.

You'll need it. It will be your guide to Grumman's new Infonet 2000 telephone system that will be switched on December 28.

Data Systems' Telecommunications group is connecting all 20,000 of the company's Long Island telephones to a New York Telephone virtual private network. This network uses the phone company's equipment yet allows Grumman Telecommunications specialists to manage it. The network is being linked with the phones at Grumman sites around the country.

It is the basis of Grumman's Infonet 2000 project, which will streamline the company's telephone system. With Infonet 2000, phone numbers will be easily reassigned and phone traffic will be routed through the most economical circuits. "The company expects to save more than $40 million over the next eight years," says Al Zoitke, director of Telecommunications.

Beginning December 28, Grummanites will change the way they call other company sites.

Instead of using a tie line code — such as "117" to call Calverton from Bethpage — you will dial "9" to get outside your site telephone exchange. You then dial a seven-digit number. Whether calling from inside or outside Grumman, you will need to know only the area code, exchange and the extension.

For example, if you are calling Grumman World in Bethpage from Melville, Great River or Calverton, you would dial 9-575-3293.

Calls from one extension to another within a location will still be made by dialing only the extension.

In addition to the new dialing plan, several locations will receive new exchanges. All Melville users will be reached on the "577" exchange; Calverton on "953"; and Great River on "224."

None of this will happen until December 28, but Telecommunications wants the word out so the transition will be smooth. It is running a poster campaign and has added a hot line — 516-346-INFO. Group heads can contact Mike Feehan, Ext. (111) 54912, if they'd like Telecommunications to explain the system to their staffs.

Telecommunications' installers have already begun making the rounds of Grumman sites to change faceplates on all telephones. Yours may have been changed already. You can ignore the information on the new faceplates until December 28.

While most Grummanites are away during the holiday, Telecommunications people will go through every Long Island plant. They'll test each telephone and leave an information packet at each desk. The packets will contain a card with dialing instructions, information on where to call for help and the new telephone directory.■

Grumman World Has Moved To Headquarters — Our New Mail Stop Is A22-GHQ

Annual Report For Grummanites: December 18

Strike Up The Band

The Grumman Employees Band will be entertaining fellow Grummanites at the following locations next month.

Building 106
Thursday, December 10
Noon to 1 p.m.
Cafeteria

Building 30
Friday, December 11
Noon to 1 p.m.
Cafeteria

Building 3
Monday, December 14
Noon to 1 p.m.
Assembly floor

Headquarters
Tuesday, December 15
Noon to 1 p.m.
Near cafeteria

Building 1
Wednesday, December 16
11:30 a.m. to 12:45 p.m.
Assembly floor

Building 43
Thursday, December 17
Noon to 1 p.m.
Cafeteria

Building 6
Friday, December 18
Noon to 1 p.m.
Assembly floor

Building 2
Monday, December 21
Noon to 1 p.m.
Assembly floor

Building 5
Tuesday, December 22
Noon to 1 p.m.
Assembly floor

Maryland Connection. *Denean Church works on a cable assembly for the E-2C Hawkeye at the Electronics Systems' facility in Salisbury, Maryland.*

Avis Gives Grumman Keys To Discount Rental Cars

The company that tries harder is making it easier for Grummanites to rent cars.

Grumman has negotiated a corporate discount for Avis rental cars. The agreement applies to Grummanites renting cars at all Avis participating locations worldwide.

Any Grumman employee can take advantage of these rates. "The employee gets the corporate rate by presenting a special I.D. card, which may be obtained from the Travel Department in Bethpage," says Jo Brune, manager of Travel Operations. "The corporate rate may be used either for business or personal travel, with some restrictions."

The corporate rate applies in the 48 contiguous states and the District of Columbia, except for five cities in Florida. These rates include unlimited mileage, are not discountable, and all rentals must be returned within a 50-mile radius of the renting location. Rates are as follows:

Car Group	*Daily Rate*
Subcompact	$33
Compact	34
Intermediate	35
Full Size 2-Door	36
Full Size 4- Door	37
Luxury	38

On rentals not returned within that 50-mile radius, corporate normal fixed amounts apply. These range from a daily rate of $34 and 22 cents per mile for a compact car to $37 and 25 cents per mile for a full-size, four-door car.

A lower rate applies to Orlando, West Palm Beach, Stuart, Melbourne, and Jacksonville, Florida. This ranges from $25 per day for a subcompact up to $29 per day for a full size, four-door car.

There are $3 and $5 surcharges for certain metropolitan areas, and an $8 surcharge for the three major New York airports and Manhattan. In addition, corporate and normal fixed rates are not available at the latter locations on weekends and holidays.

Note, too, that these are daily amounts. If your trip is for a week or longer, the city you are visiting may have a lower-cost, weekly rate.

There are also discounts for travellers to Hawaii and foreign countries. The discounts apply to normal time and mileage rates. These are: 10 percent for Hawaii, Africa, and the Middle East; 20 percent for Asia, Pacific Basin countries, Puerto Rico, and Latin America; 25 percent for Canada; and 30 percent for Western Europe.

To get your Avis card, write to Josephine Brune at A05-117 in Bethpage.■

The 25-year Luncheon Will Be Held At The Crest Hollow Country Club In Woodbury, L.I., on December 8

Grumman Gets First A-10 Contract

The U.S. Air Force has awarded Grumman a $4.9 million contract for support services for Fairchild Republic A-10 aircraft. The work will be done for the Sacramento Air Logistics Center by the Aircraft Systems Division on Long Island and at McClellan Air Force Base in California. Work under this contract is expected to be completed in December of 1988.

The A-10 had been manufactured by Fairchild Republic for the Air Force's close air support mission. There are 657 still in service.

The original solicitation for this contract was made by Fairchild Republic. At the end of September, Grumman came to an agreement with Fairchild Industries to purchase Fairchild Republic Company's Long Island Engineering Center. The center consisted of a staff of 120, including the engineering support team for the U.S. Air Force A-10s, and an aircraft flight systems simulation laboratory. The center's staff are now Grummanites.

"Some are in Business Development, others are placed where their talents are most needed in the departments here on Long Island, but most are working here in Melville," says Air Force Programs Vice President Vern Kramer.

Kramer says Grumman is waiting to hear the results of a bid on a major A-10 effort. "We are teamed with General Electric for the Low Altitude Warning and Target Enhancement (LASTE) system," says Kramer. "We expect an announcement soon."■

Many Receive New Assignments

The following Grummanites recently received new assignments:

Aircraft Systems

Configuration/Data Management: Henry H. Bontempi, group leader, A-6 Data Management; Frank E. O'Reilly, group leader, A-6 Software Configuration Management; Raymond E. Rusch, group leader, EA-6B Change Control; Peter N. Beard, group leader, EA-6B Data Management; Reginald H. Metcalf, Jr., group leader, EA-6B Status Accounting; Michael N. Dinger, group leader, E2/C2 Status Accounting.

Technical Operations: Philip Manitt, group head, Model Design; Aldo Arena, group head, Flight Controls and Mechanisms; Nicholas Dannenhoffer, manager, Support Aircraft Programs; Raymond Rice, manager, Advanced Concepts; William Jorch, manager, Development, Advanced AEW Programs; George Costidis, project engineer, Advanced Systems; Joseph Genovese, project engineer, Advanced Systems; Joseph Landfield, project engineer, Advanced Systems; Martin Golinsky, principal engineer, Advanced Systems; A. Robert Salzmann, deputy director, Advanced Systems; Melvin Gough, manager, Business Operations and Computer Requirements; Robert Montusi, section head, Power Plant and Environment; Roy Erlandson, technical specialist, Flight Controls; Robert August, engineering specialist, Flying Qualities Analysis; Robert Zupp, technical specialist, Engine Systems; Yitzchak Traeger, group head, Aerodynamic Performance; John Neiman, group leader, Propulsion, F-14 Program; Theodore Gordon, group head, Computer Architecture; John Duzich, technical specialist, Fluid Power; Nicholas Bazzicalupo, group head, Electro-Mechanical Lines.■

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Obituaries

Roger D. Geiger Sr. of Manufacturing Operations, Montgomery, Allied Division, died September 27 at the age of 35. He had been with the company since 1977 and resided at 25 East Penn St., Montgomery, Pennsylvania.

Deanna M. Phillips of Staff Administration, Montgomery, Allied Division, died July 4 at the age of 43. She had been with the company since 1983 and resided at R.D. #1, Unityville, Pennsylvania.

Louis R. Rogowski of Manufacturing Operations, Mayfield, Allied Division, died July 30 at the age of 65. He had been with the company since 1974 and resided at 432 Hudson St., Mayfield, Pennsylvania.

Personals

Jean and I would like thank all of our friends in Grumman Corporate Services for their most generous contribution to the American Cancer Society in memory of our son Robert. **Jack McNamara**

My family and I wish to thank all our friends, co-workers and ESO for their kind expressions of sympathy after the loss of my father. **Nick Maniscalco and Family**

My family and I would like to thank our friends, co-workers and ESO for their kindness, sympathy, and support during the recent loss of my mother. **Ray Dawson**

I would like to express my sincere and heartfelt thanks to all my former co-workers in the Corporate Estimating Department and other Grumman friends for making my retirement a memorable occasion. **Bob Keiser**

I would like to thank all my co-workers at Grumman for their thoughtfulness during my recent illness. **Harold J. Screven**

New Tax Law Affects Investment Plan's DCO

Over 23,000 Grummanites belong to the Employee Investment Plan (EIP). As reported late last year, the Tax Reform Act of 1986 has affected several EIP features. Due to many requests from readers, Grumman World will be highlighting these changes in upcoming issues. The first of this series deals with the deferred compensation option (DCO).

Since 1982, under Section 401(k) of the Internal Revenue Code, employers can set up savings plans that permit employees to defer taxes on some portion of their pay. Grumman calls its version of the 401(k) "deferred compensation option" or DCO.

Under the deferred compensation option, your contribution is deposited directly into your Employee Investment Plan account through payroll deduction. Since the money is not paid directly to you, it is not considered current income by the IRS. These deposits are not subject to federal, state or local taxes until they are withdrawn from the Plan.

EIP members whose total compensation from Grumman in 1987 is $50,000 or less are permitted to contribute up to 14 percent of their base salary to the deferred compensation option. Remember that the $50,000 limit includes DCO contributions to the EIP and other salary reductions such as flexible spending accounts, legal services plan, and HMO premiums. Overtime and shift differential pay is also included in this $50,000 figure.

The IRS established $50,000 as the "cutoff" for distinguishing between higher- and lower-paid people. Beginning January 1, 1988, this number is adjusted annually for inflation. This new number will be announced in late January 1988.

"To protect against 401(k) options favoring higher-paid people, the IRS designed a fairness or non-discrimination test," says Bob Bradshaw, Grumman Corporation vice president and secretary. "To meet the IRS requirements, the percentage that those people whose total annual compensation is over $50,000 may contribute is limited by the average percentage that those under $50,000 contribute."

In 1987, Grummanites whose income is more than $50,000 are allowed to contribute up to seven percent of their base salary into their DCO account, subject to a maximum of $7,000. Beginning January 1, 1988, this $7,000 maximum amount will be adjusted annually for inflation.

Under the new tax law, money in 401(k) plans — including Grumman's DCO — continues to grow tax-free until it is taken out. All withdrawals of DCO money are taxed as ordinary income.

The money accumulated through this deferred compensation option cannot be withdrawn until you are 59½ years old, or unless you meet IRS regulations for financial hardship. For instance, you can withdraw DCO funds to meet non-reimbursed medical expenses, purchase a primary residence, or pay college tuition bills.

Any hardship withdrawals made prior to age 59½ will be subject to a 10 percent early withdrawal tax. This penalty tax is in addition to the regular income tax you must pay on your withdrawn DCO money.

For instance, you have accumulated $20,000 through deferred compensation option in the EIP and you want to use this money to buy a house. You must pay income taxes on the $20,000, plus pay a penalty tax of $2,000. Remember that as of January 1, 1989, you cannot withdraw any of the earnings accrued from your DCO contributions.

People aged 59½ years or older can continue to withdraw their DCO money without any additional penalties. Their withdrawals will only be subject to ordinary income tax.

"The IRS imposes these taxes and severe restrictions to encourage people to think of company savings plans such as Grumman's EIP as sources of retiree income and not as Christmas Clubs," says Mike DeVito, manager of Pension and Investment Plans. "People should seriously consider the tax consequences before they make a withdrawal request."■

Holiday Break Moves Deadline For Two EIP Transactions

If you plan to make a lump sum contribution or change your deductions by the end of 1987, you must submit your request to the Employee Investment Plan office no later than Thursday, December 17. Normally, the deadline for these two types of transactions is five working days before the end of the month. However, the company begins its year-end holiday break on Wednesday, December 23.

If you wish to make either transaction by the end of December, make sure you mail your lump-sum contribution or authorized deduction card early, so it reaches the Employee Investment Plan office no later than December 17.

Work

It's one third of your day for probably 45 years of your life. You love it, hate it, can't wait for Mondays, or just live for Fridays. It gives meaning to your life, or maybe it's just a way to keep food in your stomach and clothes on your back.

Whatever work means to you, it's part of the way you define your place in the world. In the following story, Diane Barnes, an E-2C plane captain in Bethpage's Building 4, talks about her job.

"The plane captain makes sure the aircraft is operating properly before it leaves the ground. It's a big responsibility and you take it personally — you're the last checkpoint and your reputation is on the line.

"On the day shift in Building 4, there are about 20 of us. I work on new production E-2C's and fleet aircraft getting rework updates. There are also C-2A plane captains. There are anywhere from two to four plane captains assigned to an aircraft, but one person is in charge per shift. We take turns.

"On the flight line, the pilot and his crew first walk around the plane, making their check, and we follow behind them. When they go inside, if I'm the one in charge, I'll move in front of the plane and signal the other plane captain to air-start the engines.

"I'll signal the pilot to spread the wings and check the flaps, steering, rudder, ailerons, dome — about 12 systems in all. Inside, the flight crew checks instrumentation and other systems. When all the preflight checks are complete, the pilot will signal me to 'pull the chocks,' blocks that keep the wheels from moving. A fire guard drives me out to the runway where I make a last visual check, then signal him to taxi for takeoff.

"A plane captain has to be very careful to always follow procedures exactly. When working

'You're the last checkpoint and your reputation is on the line.'

on the flight line, you must always be aware of what's going on around you and never take what's routine for granted. Anything can happen at any given time, and you must be cautious not only for yourself but for your co-workers.

"My father has been in the company for 34 years and I used to think the last place I would work for was Grumman. I went to college for a year and a half to study occupational therapy, and I worked summers at Calverton. I got to know the kind of work the guys were doing down on the shop floor. I thought, a plane captain...that's a big job, a big responsibility — that's what I want to do.

"About five years ago, I started working in the mailroom in Bethpage. An opening came up on the job opportunity bulletin for an avionics trainee at Calverton. I had learned a lot on my own about electricity and mechanics. The rest I could learn on the job. I took courses after work in electricity and blueprint reading. Plus there

'Between the wind and the cold, you really appreciate taking turns outside. Frostbite comes quick.'

were the usual two- and three-day courses on particular devices that everybody has to take.

"After about three years as an avionics technician, I was assigned to Building 4 avionics when I learned there was an opening for a plane captain — that was also through the job opportunity bulletin. There weren't any women plane captains, so I thought it would be tough to get the job. But I spoke to John Bartenhagen, the foreman, and gave my resume to Personnel. I told him I was a good worker and a quick learner, and could handle the job. I wanted the chance to prove it. He was very helpful and said he would consider me.

"Since I was already working in the plant, people knew the kind of work I do, and that I was willing to work long hours. My supervisor also gave me a good recommendation. I found out pretty soon that I had the job.

"I've been a plane captain now 13 months. It requires a broad knowledge about everything that goes on in the airplane. There is a lot of training and skills certification involved. You need an engine-run card — you must be trained by another plane captain in the correct way to start up the engines. Another card qualifies you to service the tires with nitrogen. Plus there are Grumman courses dealing with the airplane's structure, hydraulics, electronics, and other systems that are required.

"We're outside a lot — in the summer, winter, rain, snow. I don't mind. If the weather is bad and we have to be outside for awhile, we'll take turns working inside and outside the aircraft. Between the wind and the cold, you appreciate taking turns. Frostbite comes quick.

"I get my share of going to Calverton also. I spent two weeks there with the Egyptian E-2C program. The plane that I was in charge of had to practice touch-and-goes and night flying. The only constant problem on the Egyptian program was that teaching touch-and-goes tends to wear out the tires. The Grumman test pilots can do it quickly, but the Egyptian students were just learning. So we went through a lot of tires.

"Because of their culture, the Egyptians weren't used to working with women. Three or four of them were really nice, but it took some time to be accepted by all of them. Once on the flight line I was giving hand signals, but the pilot wasn't really paying attention. Luckily, our Grumman pilot on board saw what was going on and told the Egyptian: 'She is the plane captain and a very good one. She was hired for her skills and does the same work as everybody else.' That straightened things out with him. Afterward, he spoke to the rest of the Egyptians and we had no more communication problems.

"When I became a plane captain, a lot of people were happy for me and I was surprised. I expected a lot of flack. Now, there are always going to be a few guys that say things or have an attitude, but I try to ignore them. My approach

'When working on the flight line, you must always be aware of what's going on around you and never take what's routine for granted.'

is, I'm just here to work like everybody else and expect to be treated the same way.

"The Egyptian program remained in Building 4 for five or six months for training. I was assigned one plane that I took care of every day, up until the time it left. My plane usually flew twice a day: three hours in the morning and two after lunch. I had a good aircraft. The more you fly the less problems you will have.

"Now I'm assigned to a production E-2C and it's pretty routine. We get very involved with FOD (foreign object debris/damage) checks. We can't let anything past us. Any loose hardware in an airplane can interfere with the safety of your crew if it gets into the wrong place. Every cover comes off the plane and every spot gets checked four times prior to final delivery.

"We work with the avionics people and technicians on this. But the plane captain always goes back and checks over the work.

"Since the Egyptians left, the pace of the E-2C program has slowed for me, and I have a chance to learn more. Grumman has classes throughout the year in Building 28 and every time a course comes up, I'm in school.

"Right now, I enjoy this kind of work. But I would like eventually to move into flight test — staying in contact with the airplane but handling another part of the operation. I would also like to go up in an E-2C someday. You have to be flight certified, take a swim test and all.

"I try to take on things that I think I may be a little afraid of, so I can learn how to overcome that. This job has been a good test. I was nervous about applying for it but a friend told me to go for it. I'm glad I did — it's an interesting job."■

Dedicated To The E-2C. *Diane Barnes wheels up to a Hawkeye in Bethpage's Building 4. She handles both new planes and fleet aircraft in for rework. Barnes also recently wrapped up six months on the Egyptian E-2C program. (Photo by Rich Breunig)*

How To Avoid Business Trip Headaches

Here are ways to make corporate travel more pleasant — and profitable

The Grummanite was all dressed up for a business trip, her first to the West Coast. After takeoff, she plugged in her headphones and switched from the movie to the pilot's radio channel. So she overheard the decision, over Philadelphia, to return to Kennedy due to a bomb threat.

When the plane landed, the passengers had to leave via the emergency exits. At the other end of the chutes, crash crews caught the passengers and told them to run far away. The Grummanite ran across the marshy area, soiling beyond recognition a brand-new business suit. The incident proved a false alarm.

The moral: avoid dressing up for a plane trip.

Corporate Security gives people the same advice, but for a different reason: business clothing makes you more apt to become a terrorist's target.

Each year, Grummanites log over a million miles on over 17,000 business trips. It's an adventure for some, nerve wracking for others. To help Grummanites cope, *Grumman World* has prepared the following questions and answers about the pitfalls of business travel.

What should you do if you are bumped by an airline when you have a ticket and a seat — and there is no flight until the next day?

"Bumping" occurs when an airline overbooks a flight, anticipating no-shows — only to end up with more passengers than seats. Before it bumps anyone, an airline will ask people to volunteer their seats — in exchange for a free ticket and overnight lodging. Airlines should also lodge you if you miss a connecting flight due to an equipment malfunction.

Last year, Grummanites began following per diem allowances for cities visited on business. What do you do if the per diem is not enough?

Per diem rates follow those issued by the federal government's General Services Administration. "Grumman's are revised whenever the GSA's are — usually in parts every three months," says Jo Brune, manager of Travel Operations. "Also, each fall, the GSA revises the whole list and Grumman will issue its updated list in the next few weeks. Some cities have been increased.

"But we have found that in most cities, the per diem rate is acceptable," adds Brune. For example, the per diem in Melbourne, Florida, is $75; the Ramada Inn there offers a corporate rate of $40. Also, the traveller will receive the full per diem for the travel day out provided a lodging receipt is submitted with the expense report.

What if you are attending a symposium and you must stay at that hotel — and it exceeds the per diem?

Company policy states that all expenses must be itemized and a justification memo signed by a corporate officer or his designee. This memo must be submitted with the expense report.

Do Grumman's commercial programs and groups have to follow the per diem policy?

The policy applies to all Grummanites.

Can't Grumman negotiate a blanket discount with a hotel chain?

In frequently travelled cities, Grumman's Travel Department has negotiated corporate rates with many of the large hotel chains.

To assist the business traveller, the Grumman approved travel agencies will recommend a suitable hotel within the per diem guidelines. When a hotel is booked through Austin Travel or American Express, the agency will print the appropriate per diem on the traveller's itinerary.

What if you have a guaranteed reservation at a hotel — and when you show up, the hotel is full?

When confirming a hotel reservation, always write down the confirmation number and the name of the person you are talking to. But like airlines, hotels sometimes overbook and even with a confirmation, you could be "walked." Insist that the hotel arrange alternative lodging and offer to pick up the tab.

Does this happen often?

"No...but it depends on where you're going and what's happening in that city at that particular time," says Brune. "If the Olympics are in town, you stand a good chance of being walked. But if you're visiting Houston, you will never be — hotels there are desperate for business."

How do you handle breakdowns in a rental car? What if you're in your own car?

If you are in a rental car, you can call the agency for emergency assistance 24 hours a day. Car rental companies are usually pretty quick with repairs and/or replacement vehicles. Get a feel for any potential problems when you first drive the car. If something makes you expect trouble, take it back and get another car.

If you use your own car frequently for business, it's up to you to make sure it's reliable. You might also consider an auto-club membership for $35 to $40 a year. Such clubs provide free unlimited towing. If you are going on a short trip and your car is undependable, you are permitted to rent a car. The company discourages you from driving your auto to the airport — you should instead take a limousine or taxi.

"When you take people out of their normal surroundings, it's easy for them to become intimidated," says Brune. "This is especially true when you're not a frequent traveler. The key is, don't panic in a crisis and use common sense. Handle any problem the same way you would at home."

Last but not least, Brune advises Grummanites to carefully read all of the literature in their packet of plane tickets. If you still are puzzled by something or have a question about the per diem, you can call Brune at Ext. (111) 52727 or Janet Fiore at Ext. (111) 58612 (516-575-2727 or 8612).■

Videotapes To Go

Videotapes of the Leroy Grumman Lecture Series are now available for loan. The lectures, held four times a year in Grumman headquarters, provide Grummanites with insight into emerging technologies. The series aims to further the commitment to technical excellence of the company's founder, Leroy Grumman.

If you missed any of the lectures in the series, you can borrow a tape of it. Both ½- and ¾-inch formats are available. For more information, contact Mary Mickol, Ext. (111) 58770.

Tachonics Strives To Take Mega-bites Out Of Ga

PLAINSBORO, New Jersey — The Tachonics Corporation building here is down the road from a cornfield. But the Grummanites who work in this corner of the Garden State are harvesting something very different.

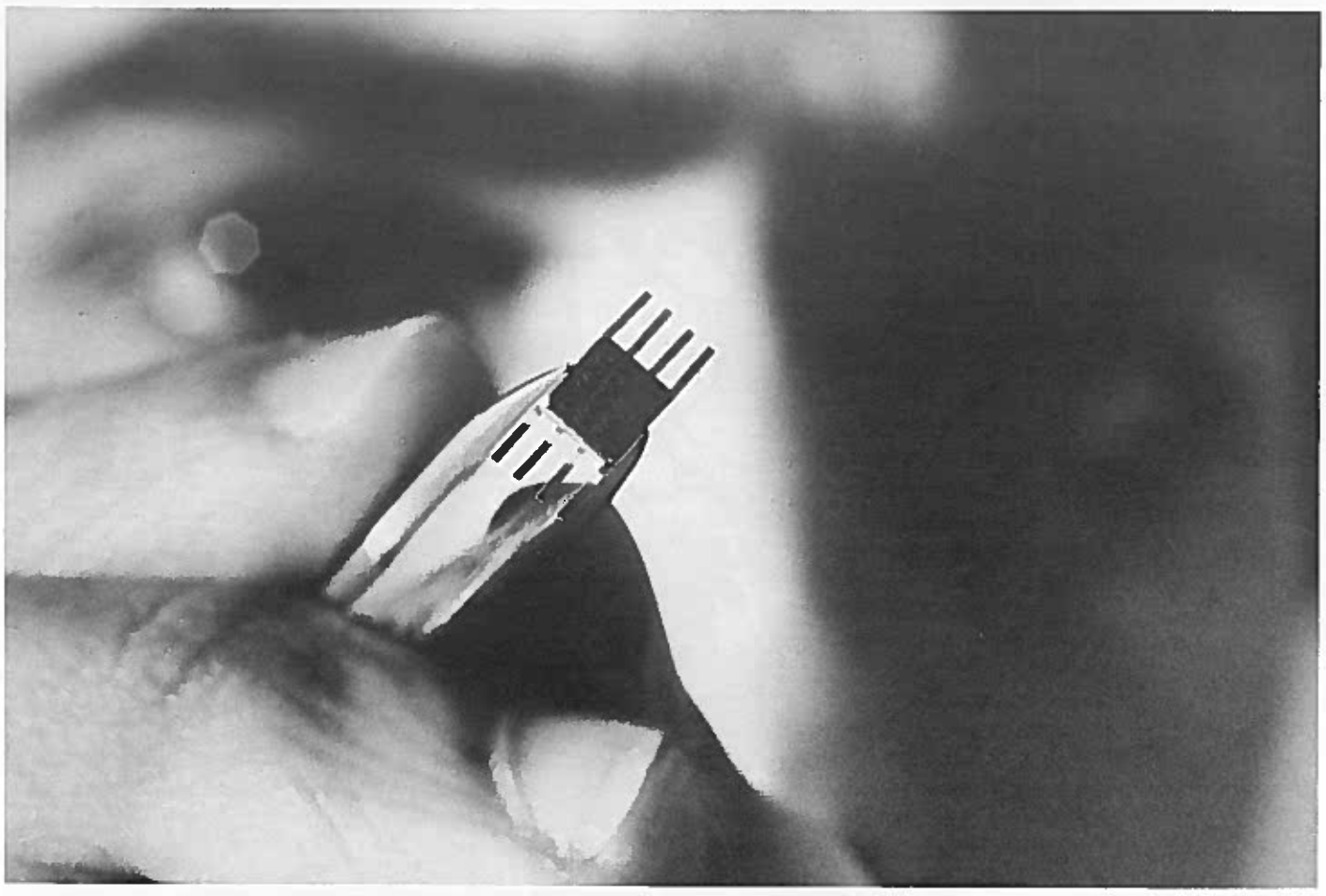
Inside spotless, dust-free laboratories, they make integrated circuits from gallium arsenide (GaAs). Tachonics is now making 10,000 circuits a month.

The fact that Tachonics has accomplished that is evidence of its success at breaking into the still-emerging gallium arsenide market. The company was set up only two years ago as an independent affiliate of the corporation within the Electronics Systems Division. Since then it has built a facility designed especially for circuit production, hired a work force of 50 microwave and semiconductor experts, and unveiled its first designs.

Tachonics' name is derived from the Greek word for speed: *tachsis*. Altogether, the name means "speed on integrated circuits." Its president, Chuni Ghosh, is a soft-spoken, Indian-born physicist well known in the gallium arsenide field. He came to Tachonics from ITT and has since recruited dozens of other recognized industry specialists to the new company.

Ghosh says Grumman's investment has been money well spent. "We are the only gallium arsenide start-up to reach production capability in that short a time, and at a relatively low cost," he says. "Some aerospace companies have reportedly invested as much as $100 million over the years in gallium arsenide integrated circuit research. In comparison, Grumman has spent a small fraction of that to achieve comparable capability."

Individual silicon chips are tiny; gallium arsenide ones are even smaller. Pick one up and it will fit quite nicely in the smallest whorl of your fingerprint.



Special Care. *Some customers order finished circuits in a gold-plated housing. Even at this stage, the finished gallium arsenide circuit is small, as Mark Brenner shows you in this photo. (Photos by Bob Settles)*

"Gallium" is a byproduct of aluminum production, while "arsenide" is that well-known poison, arsenic. Gallium arsenide costs about $200 a wafer. That compares to $10 for silicon, which comes from sand. The cost of gallium arsenide chips is expected to come down as supplies increase.

Gallium arsenide conducts electricity better than silicon and can therefore speed up the performance of electronic devices. Silicon conducts electrical current in megacycles (millionths of a cycle). Gallium arsenide conducts it in *gigacycles* (billionths). It is also 10 to 100 times more resistant to heat and radiation.

"Because of industry orders, we have ramped up production to 10,000 ICs a month," says Ghosh. "To meet the increase, people from non-production areas, including myself, are pitching in where they can."

There's a chart on the wall in the main corridor that tracks progress. On a given day, you might find Joe Brand, a designer, in the clean room applying epoxy to chips or "dies." Across the way, Chris Rapisarda inspects them with a scope hooked up to a TV monitor. She normally works in the Finance department. On her lunch hour, receptionist Shelly Williams works at another microscope, using a super-thin pair of tweezers to pick out dies from the wafers.

"Some of the tasks are fairly simple," says Rich Makkay, an assembly technician who joined Grumman from RCA. "Once you get trained, all you need is a steady hand and patience. We hope to hire about eight more production people before the year's end."

Tachonics' management is very pleased with the yields — the number of usable dies obtained from the raw wafers. The exact figures are kept secret for competitive reasons.

"We've been able to hire some great people," says Doug Maki, vice president—Microwave Products. "I've been in this industry for 20 years, and this is a much better atmosphere than any organization I've worked in. The prevailing attitude here is 'how can I help get the job done?' rather than 'give me something interesting to do'."

Tachonics' first customers are all buyers of microwave circuitry, the building blocks of radar systems. In addition to processing electrical current more efficiently, gallium arsenide circuits can process much higher frequencies. They also are smaller and weigh less. One dot-sized monolithic microwave integrated circuit (MMIC—monolithic meaning it consists of one crystal) can replace a 2-by-2-inch silicon chip.

This is a boon for aircraft designers: today's planes are beginning to be weighed down by radar and electronic countermeasures equipment. In fact, the E-2C and EA-6B airframes are being beefed up to handle the extra weight. Gallium arsenide is touted as *the* material for the radar aboard the Advanced Tactical Fighter and Advanced Tactical Aircraft. Such a system would deliver astonishing capabilities without adding pounds.

Grumman's conformal radar engineers are investigating gallium arsenide. The current E-2C Hawkeye's gawky rotodome could be replaced by a radar system embedded in its airframe. In addition to conventional radar devices, some experts are talking about tomorrow's "smart munitions": guided missiles with their own radar systems.

Microwave is an *analog* technology; Tachonics plans to begin producing digital circuits next year. The two kinds of automobile speedometers are a good illustration of the difference between analog and digital technologies. A conventional, analog gauge shows the information on a scale. The

In The Beginning. *In the photo at left, Sokhom Suy mounts a gallium arsenide wafer onto a disk. This is one of the first production steps at Tachonics, which has so far processed over 1,000 wafers. Above, Amin Ezzeddine (L), principal engineer, runs a modelling program to test a microwave circuit design while layout designer Jeff Bradley works on a design of a hybrid analog/digital switch.*

ium Arsenide Market

newer digital displays show only exact numerical values.

"The microwave circuit is not as densely packed with interconnects and transistors as a digital circuit," says Maki. "For this reason, the digital production process is more complicated and requires more perfect crystals."

Though the development of digital circuits from gallium arsenide is picking up rapidly, silicon is about a decade ahead. The highest density silicon chips contain several hundreds of thousands of microminiaturized transistors.

This has served to create something of a Catch 22: computer engineers generally are not designing products with gallium arsenide in mind, because there are few such components available. Likewise, companies that make them have a tough time selling them.

But Steve Goodspeed, vice president—Digital Products, says that's a risk the company must take. "The question is not if the market will take off, but when," says Goodspeed. "A company must come up with the right products so people can start designing and solving system problems. And since it will be a very small market initially, it's important to do it right the first time."

Goodspeed says the company will concentrate first on standard circuits, which will have general use and appeal. These generic products could be easily customized by computer and electronic-system engineers. Teamed with California Micro Devices, Tachonics will introduce prototype circuits in December.

Tachonics and Gigabit Logic Inc., recently announced a second-sourcing agreement. Gigabit Logic is the largest manufacturer of gallium arsenide digital circuits.

Tachonics has lined up manufacturers' representatives to sell the digital product. "We sign up people in the same type of business, but not with competing product lines," says Goodspeed.

Tachonics will soon unveil a hybrid analog-digital switch for microwave systems. Hybrid circuits are required in those radar and electronic warfare systems where analog and digital technology must be linked. A hybrid circuit combines the attributes of both on one chip. Such silicon circuits are common; gallium arsenide hybrid circuits are rare.

In addition to its own research and development projects, Tachonics is helping Long Island Grummanites on theirs. It will provide a 1.5 watt amplifier circuit for Grumman Space Systems Division's space-radar antenna. The high-speed data bus that will next year link the whole Engineering Development Center will use two Tachonics circuit designs.

Within the Electronics Systems Division, Tachonics will also build circuitry for the Electronics Systems Division's telerobotic mobile antiarmor platform (TMAP) and some prototype test equipment.

Though interest in gallium arsenide has been in the military sector, Ghosh says the material has also found its way into backyard satellite dishes, radar detectors, and other consumer items.

He adds that the autonomy the firm has enjoyed has enabled it to grow fast. "We've had the right kind of support from Bethpage," says Ghosh. "We've had their backing but we've been given a lot of freedom. It's an experiment. If Grumman sees it succeed, maybe it will do more such ventures. I believe it's working."■

Steady Hand. *Sokhen You works at the die-attachment station. Through a scope, she guides a device that automatically picks up a die from a tray, puts a dot of epoxy, and positions it for placement in a gold housing.*

Surgical Precision. *Daryl Pemberton removes a gallium arsenide wafer from the ion implantation machine. This machine adds ions to the top surface of the wafer, allowing it to conduct electricity.*

They Have A Strict Dress Code

All production at Tachonics takes place inside specially built, dust-free "clean rooms." When you enter the area, you must don gowns, caps, and pants made of non-shedding fabric. Rubber-soled booties fit over your shoes. If you have a beard or mustache, you must wear a mask. You have to put rubber gloves on, too.

The entrance to the area is through a glass chamber with an adhesive on the floor to keep dust and dirt from being tracked in. The air inside is a constant 70° F and in the ceiling are Class 100 filters. That means in a cubic foot of air, there are less than 100 particles of .5 microns or smaller. Once a week, a person from an environmental company comes in and pushes a sticky roller over the floor to pick up any stray particles.

It's a pretty quiet place, save for the whirring of machinery and a radio in the background playing rock-and-roll.

Tachonics buys gallium arsenide in three-inch round wafers, which can yield 4,000 chips or, more accurately, "dies." These are the raw materials of more complex circuits.

A polishing machine slowly grinds a wafer down to its ultimate .004-inch thickness. Next, wafers go into an ion implanter. This giant machine adds ions to the top surface of the wafer, allowing it to conduct electricity.

Circuitry is imprinted onto the wafers using a photographic process. A vendor makes a glass pattern, or mask, from Tachonics' circuit designs. Each mask contains many designs, and goes inside a special camera. This device exposes the gallium arsenide wafer to light. Chemicals then wash away the exposed area.

There is now a pattern imprinted on the wafer of circuits, each containing interconnects and transistors. This process can be repeated as many times as necessary to build a desired circuit. For microwave circuits, the process typically gets repeated 10 to 12 times.

A computer controlled machine delicately slices the wafer into its many die segments. People at microscopes pick out the dies with tweezers. Individual die can be simply packaged in sterile cases or more complex circuits can be built using epoxies and heat treatment.

For some customers, it all goes into a metal housing or package. The final product is a gold-plated piece about the size of an engagement diamond.

Before delivery to the customers, the devices get tested using a variety of microscopes and meters. Some circuits go into a special oven for days at a time. Others have nitrogen blown on them to chill them to frigid temperatures while technicians input electrical currents and take measurements of their performance.■

J. H. Achilich

J. A. Anderson

L. Antlick

J. A. Arcara

G. G. Arra

A. J. Badstuebner

K. A. Baker

W. P. Barry

E. E. Binford

E. P. Brostek

T. E. Butler

J. M. Buttino

R. N. Clark

T. G. Coker

P. J. Conklin

J. A. D'Amico

T. J. Dija

T. Felber

F. W. Fleischhauer

R. J. Gran

M. J. Guido

D. D. Hastings Jr.

W. K. Hoffman

T. Jew

A. J. Kellman

C. E. Ketcham

F. B. Kozak

T. F. Lancer

D. J. Makoske

P. J. Marsh

M. B. Mauricio

R. J. McDowell

J. G. McGowan

R. T. Minlionica

W. L. Powell

J. E. Raha

A. J. Regalmuto

P. A. Reilly

D. L. Reuss

J. R. Riordan

D. J. Sansone

W. J. Scally

R. W. Schrage

H. J. Silverman

B. Simmons

W. J. Steffen Jr.

T. W. Steffens

F. L. Syrett Jr.

Service Milestones

Next month's issue will be the *1987 Annual Report For Grumman People.* There will be no listing of Service Milestones in that issue. Those Grummanites who celebrate service anniversaries in December are listed below.

45

November

Ferdinand F. Kokoska, Bethpage, Aircraft Systems
Marie B. Trimborn, Bethpage, Corporate Services
Frank L. Yerk, Bethpage, Corporate Services

40

November

Warren R. Bolle, Bethpage, Space Systems
Paul F. Butler, Melville, Aerostructures
Walter A. Duester, Melville, Aircraft Systems
Pasquale R. Gatta, Melville, Electronics Systems
Fred G. Kenneth, Bethpage, Aircraft Systems
John Marshall, Bethpage, Corporate Services
William Penza, Bethpage, Corporate Services
Herman E. Schlock, Calverton, Aircraft Systems
Allen L. Smith, Bethpage, Aircraft Systems

December

Joseph T. Montello, Great River, Electronics Systems
Harry A. Vest, Melville, Aircraft Systems
Frederick W. Wright Jr., Bethpage, Corporate Services
Edward R. Yurkerwich, Hicksville, Aircraft Systems

35

November

Rocco Amone, Calverton, Aircraft Systems
George H. Angelbeck, Bethpage, Aircraft Systems
Victor Baldasar, Bethpage, Aircraft Systems
John L. Brooks, Bethpage, Corporate Services
James A. Carroll, Bethpage, Corporate Services
Harold E. Corley, Bethpage, Aircraft Systems
Thomas E. Egan, Bethpage, Aircraft Systems
Harold J. Harrington, Bethpage, Aircraft Systems
Robert W. Harvey, Bethpage, Aircraft Systems
Leonard J. Herte, Los Angeles, Aircraft Systems
William C. Heu, Calverton, Aircraft Systems
David L. Holtje, Bethpage, Data Systems
Karl H. Jurgensen, Bethpage, Aircraft Systems
Charles G. Kamp Jr., Bethpage, Aircraft Systems
Arthur S. Lauf, Bethpage, Aircraft Systems
John H. Lueck, Stuart, Aircraft Systems
Thomas J. McCaffrey, Great River, Electronics Systems
Edward F. Moran, Bethpage, Aircraft Systems
Vincent G. Perniciaro, Bethpage, Aircraft Systems
Carmine V. Romuno, Bethpage, Aircraft Ststems
James V. Rose, Melbourne, Melbourne Systems
Edward T. Swanteson, Bethpage, Aircraft Systems
Daniel F. Timoney, Bethpage, Aircraft Systems
Joseph E. Waesche III, Bethpage, Corporate Services
James Wells, Bethpage, Aircraft Systems
Peter Yampieri, Bethpage, Aircraft Systems
Joseph J. Zinzi, Great River, Electronics Systems

December

George W. Bauer, Milledgeville, Aircraft Systems
Loretta K. Gagne, Bethpage, Corporate Services
William L. Jankowski, Calverton, Aircraft Systems
Gerard T. Murphy, Bethpage, Aircraft Systems
John Rock, Bethpage, Aircraft Systems

30

November

Arthur Haas, Bethpage, Aircraft Systems
William R. Jensen, Melville, Melbourne Systems
Thomas Kubik, Bethpage, Aircraft Systems
Edward E. Miller, Bethpage, Space Systems
Richard O. Ohlsen, Calverton, Aircraft Systems
Anthony J. Scura, Bethpage, Aircraft Systems

December

Robert P. Joyce, Bethpage, Corporate Services
John R. Stafford Jr., Crane, Aircraft Systems

25
November

Joseph B. Abell, Patuxent River, Technical Services
John H. Achilich, Bethpage, Aircraft Systems
John A. Anderson, Bethpage, Aircraft Systems
Lawrence Antlick, Bohemia, Electronics Systems
John A. Arcara, Bethpage, Aircraft Systems
George G. Arra, Pt. Mugu, Aircraft Systems
Albert J. Badstuebner, Bethpage, Aircraft Systems
Kim A. Baker, Bethpage, Aircraft Systems
William P. Barry, Great River, Electronics Systems
Edward E. Binford, Bethpage, Aircraft Systems
Edward P. Brostek, Bethpage, Aircraft Systems
Edward D. Buckham, Great River, Electronics Systems
Thomas E. Butler, Calverton, Aircraft Systems
John M. Buttino, Bethpage, Aircraft Systems
Robert N. Clark, Bethpage, Aircraft Systems
Thomas G. Coker, Bethpage, Aircraft Systems
Patrick J. Conklin, Bethpage, Aircraft Systems
Jack A. D'Amico, Bethpage, Aircraft Systems
Frank A. DiRocco, Bethpage, Aircraft Systems
Theodore J. Dija, Great River, Electronics Systems
Theodore Felber, Melville, Aircraft Systems
Frederick W. Fleischhauer, Bethpage, Data Systems
Richard J. Gran, Bethpage, Aircraft Systems
Michael J. Guido, Bethpage, Corporate Services
Dean D. Hastings Jr., Bethpage, Aircraft Systems
William K. Hoffman, Bethpage, Data Systems
Tommy Jew, Melville, Aerostructures Division
Aaron J. Kellman, Bethpage, Aircraft Systems
Clinton E. Ketcham, Great River, Electronics Systems
Richard F. Konig, Bethpage, Aircraft Systems
Francis B. Kozak, Bethpage, Aircraft Systems
Thomas F. Lancer, Calverton, Aircraft Systems
Daniel J. Makoske, Calverton, Data Systems
Philip J. Marsh, Edwards AFB, Aircraft Systems
Manoel B. Mauricio, Calverton, Aircraft Systems
Ronald J. McDowell, Calverton, Aircraft Systems
John G. McGowan, Great River, Electronics Systems
Ronald T. Minlionica, Bethpage, Aircract Systems
William L. Powell, Bethpage, Aircraft Systems
John E. Raha, Bethpage, Aircraft Systems
Antonio J. Regalmuto, Melville, Aircraft Systems
Kenneth L. Reider Sr., Bethpage, Aircraft Systems
Patricia A. Reilly, Melbourne, Melbourne Systems
Donald L. Reuss, Bethpage, Aircraft Systems
James R. Riordan, Bethpage, Aircraft Systems
Dominick J. Sansone, Calverton, Aircraft Systems
Walter J. Scally, Bethpage, Data Systems
Richard W. Schrage, Bethpage, Aircraft Systems
Harold J. Silverman, Bethpage, Aircraft Systems
Bernard Simmons, Bethpage, Aircraft Systems
William J. Steffen Jr., Melville, Aircraft Systems
Theodore W. Steffens, Bethpage, Aircraft Systems
Frank B. Sutter Jr., Bethpage, Aircraft Systems
Fred L. Syrett Jr., Pt. Mugu, Aircrat Systems
Robert J. Toye, Bethpage, Aircraft Systems
Douglas R. Tvrdik, Pt. Mugu, Technical Services
Louis Vacca, Bethpage, Aircraft Systems
Howard B. VanCott Jr., Bethpage, Aircraft Systems
Roy R. Wagner, Bethpage, Aircraft Systems
Clarence Warren Jr., Bethpage, Aircraft Systems
Raymond W. Weitzel, Bethpage, Aircraft Systems

(Continued on page 10)

R. J. Toye

L. Vacca

R. R. Wagner

W. J. Wild Jr.

G. H. Yefchak

J. Zeman

J. Zielinski

A. J. Baldwin

J. Baumgartner Jr.

R. Beadle Jr.

P. J. Bianchini Jr.

H. J. Borstell

L. H. Borts

R. H. Boudreau

R. E. Bradford

L. Burns

M. Burt

R. R. Bury

J. D. Caffrey

J. R. Cheek

T. A. Conway

L. J. Cress

R. J. Droll

W. R. Everett

J. B. Frischman

G. R. Gagnon

R. J. Garveson

A. R. Giordano

D. J. Grisanzio

R. R. Gunter

G. W. Haarstick

G. J. Harrington

P. W. Hodge

H. J. Hugo

J. Hults

R. M. Inniss

G. Koopman

J. D. Michaelsen

P. J. Morelli

R. D. Muller

J. C. Norton

L. Obracanik

A. C. Pesce

L. J. Piscola

W. A. Polaskey

G. Romano

M. Schecker

J. Schwarz

H. J. Sowa

J. S. Starmack

H. E. Verity

J. E. Walsh

J. R. Weekes

J. G. White

Avoid Shopping Mall Jams; Shop At Your Local ESO

There are 25 shopping days left until Christmas. Soon, people will park half a mile away from jam packed stores and malls where they have decided to spend several weeks of their salary. Grumman employees can avoid some of the madness by strolling down to their nearest Employee Services Office.

Holiday items range from tree ornaments to T-shirts and sweatshirts decorated with the Grumman Tomcat dressed up as Santa Claus. They are available in all sizes and start at about $5.50. E.S.O. offers a wide variety of many other T-shirts and sweatshirts.

For keeping someone warm this winter, a jacket may be the perfect gift. From $17.95 to $44.95, Employee Services offers heavy, medium, lightweight and bomber jackets in all different sizes and colors. There is also an assortment of sweatsuits for men and women.

The shops are stocked with Estee Lauder perfume, cologne and cosmetics. Swersey's holiday candy and gift items are featured in a brochure and are available by filling out an order form. The cutoff date for placing an order is usually a week to 10 days.

In the ESO store in headquarters on the concourse level, holiday flowers can be ordered with a three-day advance notice. Fresh flowers are also always on hand in the shop.

There are specially ordered handcrafted wooden trucks available starting at $16.55. Aircraft models are also being sold.

After the shopping is over, the real work begins — wrapping. E.S.O. sells wrapping paper, bows and cards for the holidays and other occasions.

The headquarters ESO shop is open every day from 7:30 a.m. to 12:30 p.m. and 1:30 to 3:30 p.m. Shop hours in other buildings vary; hours are posted on the shop door.

There are many other gift items available. However, not all of the merchandise is available in every shop. The Employee Services representative in your building will tell you where to get unstocked items.■

Service Milestones

(Continued from page 9)

William J. Wild Jr., Woodbury, Data Systems
George H. Yefchak, Great River, Electronics Systems
Joseph Zeman, Bethpage, Aircraft Systems
John Zielinski, Calverton, Aircraft Systems

December

Fred Austin, Bethpage, Aircraft Systems
Arthur J. Baldwin, Calverton, Aircraft Systems
Joseph A. Baumgartner Jr., Bethpage, Space Systems
Ray Beadle Jr., Bethpage, Data Systems
Peter J. Bianchini Jr., Bethpage, Aircraft Systems
Hans J. Borstell, Milledgeville, Aircraft Systems
Lawrence H. Borts, Bethpage, Aircraft Systems
Robert H. Boudreau, Bethpage, Aircraft Systems
Russell E. Bradford, Stuart, Aircraft Systems
Richard F. Brophy, Melville, Aircraft Systems
Lewis Burns, Huntington Beach, Aircraft Systems
Marguerite Burt, Bethpage, Data Systems
Ronald R. Bury, Woodbury, Data Systems
John D. Caffrey, Las Vegas, Aircraft Systems
Thomas J. Calisto, Cherry Point, Aircraft Systems
John R. Cheek, Melville, Aircraft Systems
Peter Coniglio, Houston, Electronics Systems
Joseph L. Conlon, Great River, Electronics Systems
Thomas A. Conway, Calverton, Aircraft Systems
Lamar J. Cress, Bethpage, Aircraft Systems
Gaetano S. Cuce, Great River, Electronics Systems
Raymond J. Droll, Bethpage, Aircraft Systems
William R. Everett, Calverton, Aircraft Systems
Jacque B. Frischman, Bethpage, Aircraft Systems
George R. Gagnon, Bethpage, Aircraft Systems
Alvin Gartenberg, Bethpage, Aircraft Systems
Robert J. Garveson Jr., Bethpage, Aircraft Systems
Anthony R. Giordano, Bethpage, Aircraft Systems
Dominick J. Grisanzio, Bethpage, Aircraft Systems
Robert R. Gunter, Bethpage, Aircraft Systems
George W. Haarstick, Melville, Electronics Systems
George J. Harrington, Melville, Aircraft Systems
Philip W. Hodge, Bethpage, Corporate Services
Herman J. Hugo, Melville, Aircraft Systems
Joseph Hults, Bohemia, Electronics Systems
Rhett M. Inniss, Bethpage, Aircraft Systems
Robert A. Irwin, Calverton, Aircraft Systems
James S. Knipe, Calverton, Aircraft Systems
Gerard Koopman, Bethpage, Aircraft Systems
John D. Michaelsen, Melville, Aircraft Systems
Paul J. Morelli, Bethpage, Aircraft Systems
Raymond D. Muller, Bethpage, Aircraft Systems
James C. Norton, Calverton, Aircraft Systems
Thomas D. O'Hara, Bethpage, Aircraft Systems
Larry Obracanik, Bethpage, Aircraft Systems
Alphonse C. Pesce, Calverton, Data Systems
Lee J. Piscola, Bohemia, Data Systems
William A. Polaskey, Calverton, Aircraft Systems
Guido Romano, Melville, Aircraft Systems
Melvin Schecker, Melville, Aircraft Systems
Jakob Schwarz, Bethpage, Aircraft Systems
Harry J. Sowa, Great River, Electronics Systems
John S. Starmack, Melville, Aircraft Systems
Paul K. Suh, Bethpage, Aircraft Systems
Harry E. Verity, Bethpage, Aircraft Systems
James E. Walsh, Calverton, Aircraft Systems
Jean R. Weekes, Norfolk, Aircraft Systems
John G. White, Bethpage, Aircraft Systems
Otto D. Wood Jr., Calverton, Aircraft Systems

Holiday Spirit

Would you like a kosher turkey for your family instead of the traditional Grumman turkey? You can have one. Don't pick up a Grumman turkey at the usual distribution time. Instead, buy a kosher turkey at the store of your choice.

If you are a Long Islander, bring your 1987 Grumman Turkey ticket and the receipt from your kosher turkey to any Employee Services Flight Shop in Bethpage, Calverton, Great River or Melville before January 31, 1988. Employee Services will phone you when your reimbursement check for up to $16 is ready for pick-up.

The reimbursement will be handled locally for Grummanites at other sites across the country. Contact your administrator for details.

If you'd like to donate your holiday turkey to a worthy organization or family, just send your turkey ticket to Sharon Grosser, M/S A33-GHQ.

Winter Weather Watch

It snowed last night. You dig your car out of a drift. After slipping and sliding all the way to work, you discover Grumman is closed.

Whether it's the snowstorms in the North or the cold bouts of winter in the South, Grummanites can find out if their facility is open by calling special weather emergency telephone numbers. Some sites have also made arrangements with local radio stations to announce closings or delays.

On Long Island

Bethpage, Bohemia, Great River, Holtsville, Melville, and Woodbury—349-9400; Calverton—369-2266

Grummanites on Long Island can also set their radio dials to: WGSM 740AM; WBLI 106.1FM; WGLI 1290AM; WGBB 1240AM; WNYG 1440AM; WLIN 1580AM; WALK 1370FM

Other Grumman Sites

Arkadelphia, Ark.—(501) 246-4561; KVRC 1240AM
Glen Arm, Md.—(301) 592-7022; WFBR 1300AM
Houston, Tex.—(713) 484-2008; KTRH 740AM
Huntsville, Ala.—(205) 830-5900
Mayfield, Pa.—(717) 876-4560; WARM 590AM, WEJL 630AM or WCDL 1440AM
McLean, Va.—(703) 556-7400; 1500 AM or 630AM
Milledgeville, Ga.—(912) 452-0586; WMVG 1450AM or WKZR 102.3FM
Montgomery, Pa.—(717) 322-4676; WILQ 105.1FM or WLYC 1050AM; WWPA 1340AM; WYRS 97.7FM; WFXX 99.3FM; WMLP 1380AM; WOEZ 101FM; WKOK 1070AM; WQKX 94.1FM; WHLM 55AM; WHOT 103.9FM; KISS 102.7FM
Princeton, N.J.—(609) 924-3600; WHWH 1350AM
Roanoke, Va.—(703) 982-6666; Vinton Plant-(703) 985-2203; Service Center-(703) 985-2220
Salisbury, Md.—(301) 548-7800; WICO 94FM or WSBY 960AM
St. Augustine, Fla.—(904) 829-2501; WSOS 105.5FM; WAIA 1170AM; WFOY 1240AM; WAOC 1420AM; WUVU 97.7FM
Stuart, Fla.—WRIT 92.7FM; WHLG 102FM; WSTU 1450AM; WOVV 96FM; WFTP 1330AM; WIRA 1400AM; WTTB 1490AM; WGYL 93.5FM; WEAT 104.5FM, 850AM
Sturgis, Mi.— (616) 651-2383; WSTR 99.3FM; Ft. Wayne—WOWO 1190AM
Titusville, Fla.—WAMT 1060AM; WSCF 98.3FM; WTAI 1560AM; WVTI 107.1FM; WMMB 1240AM; WYRL 102.3FM; WMEL 920AM; WCKS 860AM; WRKT 1300AM; WSSP 104.1FM; WEZY 1350AM, 99.3FM
Tullahoma, Tenn.—(615) 454-7752; WKQD 93.3 FM
Western Region, Los Angeles—(213) 215-1612; KNX 1070AM; KFWB 980AM

Grumman Models Make Super Holiday Presents

A Grumman model airplane may be that holiday gift that you're looking for. Here is a listing of Grumman models that can be purchased at most hobby shops.

X-29- by Hasegawa, 1/72 scale, $6.

F-14A Tomcat- by Hasegawa, 1/72 scale, $8.50 or MPC, $7; by Revell, 1/48 scale, $7.50 or Fujimi, $23 or Monogram for $7.75; by Revell, 1/32 scale, $25 or Tamiya, $70.

EA-6B Prowler- by Hasegawa, 1/72, $8.50; by MPC, 1/48, $8.

A-6A Intruder- by Hasegawa, 1/72, $6; by Fujimi, 1/48, $14.

A-6E TRAM- by Hasegawa, 1/72, $6.

E-2C Hawkeye- by Fujimi, 1/72, $12.

EF-111A Raven- by Monogram, 1/72, $5.50.

LM Lunar Module- by Monogram, 1/48, $10.

OV-1B Mohawk- by Hasegawa, 1/72, $5.50.

S2F1 Tracker- by Hasegawa, 1/72, $10.

F11F-1 Tiger- by Hasegawa, 1/72, $5.50.

F9F-8 Cougar- by Hasegawa, 1/72, $5.50.

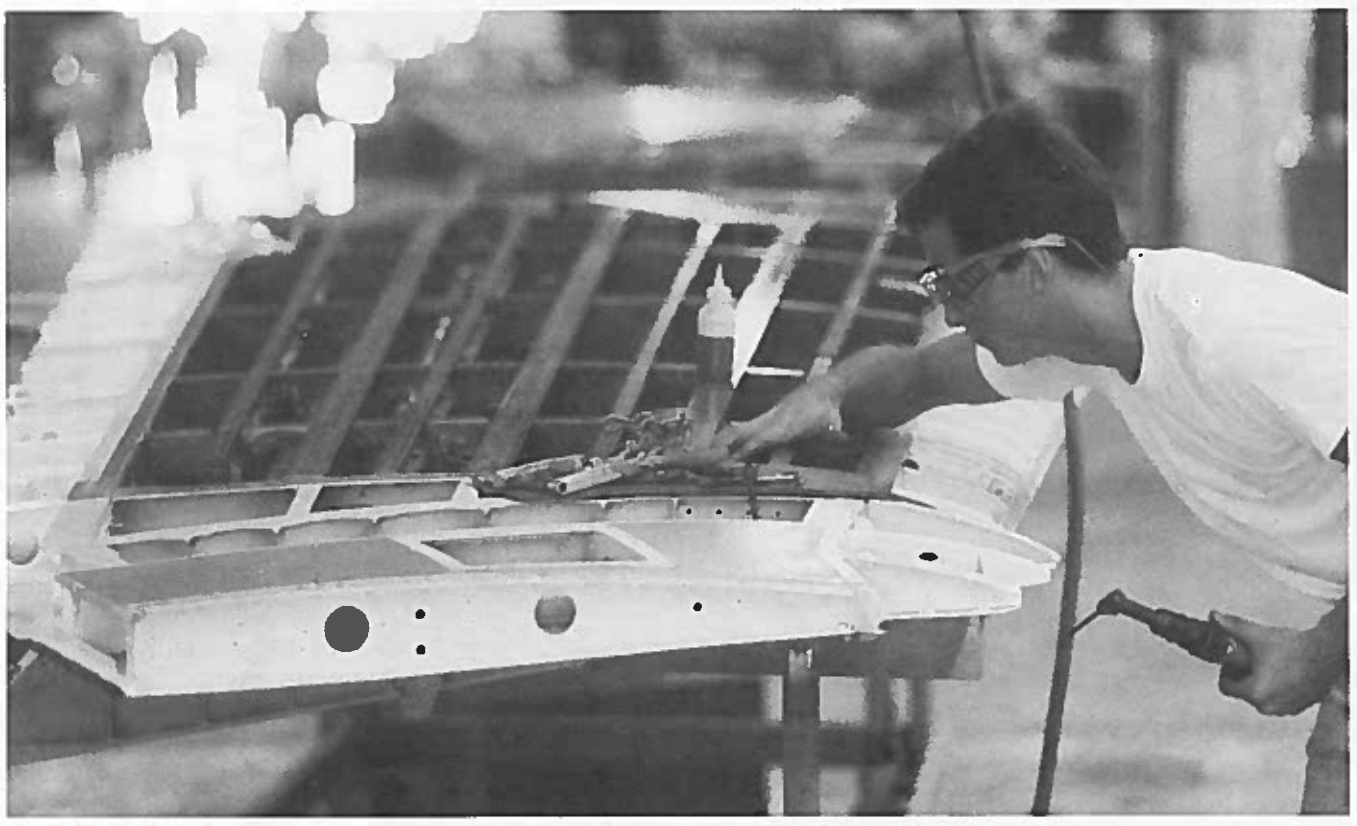
F9F-2 Panther- by Hasegawa, 1/72, $5.50.

F8F-1 Bearcat- by Testors, 1/48, $8.

F6F-3/5 Hellcat- by Hasegawa, 1/72, $3.50 or MPC, $4 or Heller, $4 or Matchbox, $3; by Hasegawa, 1/32, $30.

F4F-4 Wildcat- by Revell, 1/72, $3; by Revell, 1/32, $12.

TBF-1- by Monogram, 1/48, $5 or Lindberg, $6.50.■



Keeping Busy. *At Grumman St. Augustine, Roger Kuba is rebuilding an A-6 wing. Other programs now in progress at the Florida facility include overhaul and support work for the Navy's KA-6D tankers; A-6 Target Recognition Attack Multisensor (TRAM) retrofit conversion; and modification and depot-level maintenance of the TC-4C trainer.*

Grumman's Great Decisions Program Can Make You A Foreign Policy Expert

Over 100 Grummanites have become better informed about the world through an after-hours discussion program called Great Decisions.

The program began at Grumman in 1984. Participants spend one evening a week for two months discussing important foreign-policy issues. This year, there were 70 Grummanites in three discussion groups.

In 1988, Great Decisions will be offered on Tuesday, Wednesday and Thursday nights. Topics will include Mexico and the U.S. as allies, risks and opportunities for U.S. trade and global markets, Gorbachev's reforms in the U.S.S.R., the U.S. and the Middle East, reassessing the global threat, the future of democracy in South Korea, Western Europe — between the superpowers, and projecting U.S. foreign influence.

Great Decisions is a project of the nonpartisan Foreign Policy Association. About 250,000 people participate, most in circles sponsored by community groups, schools, churches, synagogues, the military, and public libraries.

Before each meeting, participants read the chapter in the Great Decisions briefing book pertaining to that week's topic. The book includes an in-depth article, views of current administration officials and their critics, and suggested readings and questions for discussion.

After each meeting, participants record their opinions on a ballot. This is tabulated by the Foreign Policy Association. Results are published in an annual report that is distributed to policymakers.

Rick Bennett, a tool designer in Building 2, Bethpage, was a newcomer to the program in 1987. He plans to sign up again. "It was very informative," he says. "I really enjoyed it. We had some interesting debates. For instance, America's role in Vietnam often came up, when we discussed current controversies. There were conservatives and liberals — it didn't matter what age a person was."

JoAnne Walters, an analyst in Material Inventory Planning and Analysis, Building 30, signed up at the very beginning in 1984. Walters especially likes hearing the opinions of people from a wide variety of backgrounds.

"One member's father was in the foreign service," she recalls. "The man had been raised in Europe. He was able to give us an insight into how the Europeans view America, things we normally wouldn't have even thought of."

If you want to sign up for Great Decisions 1988, fill out the form on this page and send it to Grumman International, mailstop A32-GHQ.■

Great Decisions '88

Please sign me up for the 1988 Great Decisions program.

Name.....

Dept.....Mailstop..... Ext.....

Days available: ☐ Tuesday ☐ Wednesday ☐ Thursday

Mail to: Grumman International, A32-GHQ

Professionally Speaking

Grummanite Rosemary Russo has been elected the North American president of the CADAM Users Exchange.

Russo is in charge of training on the Grumman Engineering and Manufacturing System (GEMS) and works in Building 25, Bethpage. GEMS is the computer-aided design and drafting system used by Grumman engineers in most divisions. It runs the CADAM (Computer Assisted Design and Manufacturing) software package and a host of other design tools.

The exchange includes 327 corporate members who lease CADAM. Russo has served on the exchange's board of directors for the last five years.

Vols Needed To Help People With Tax Returns

The Internal Revenue Service is looking for volunteers to participate in its Volunteer Income Tax Assistance (VITA) program.

Volunteers help people in their community who need assistance with their tax returns. This help is usually given in neighborhood and community centers, libraries, churches and shopping malls.

Instruction and materials are free. Training is usually available December through January at convenient locations.

To join VITA, call the IRS coordinator in Brooklyn, (718) 780-6020; or write to P.O. Box 606, Brooklyn, N.Y. 11202.

Readership Survey

We don't want to do all the talking. We'd like to know what you think about the things you see in these pages. Your comments, suggestions and complaints are welcomed. Please take a few minutes and give us your opinions.

Article	Great	Good	Poor	Didn't Read
F-14A+ (Pg. 1)	☐	☐	☐	☐
New Phone System (Pg. 2)	☐	☐	☐	☐
EIP and DCO (Pg. 3)	☐	☐	☐	☐
Work Article (Pg. 4)	☐	☐	☐	☐
Business Travel (Pg. 5)	☐	☐	☐	☐
Tachonics (Pg. 6)	☐	☐	☐	☐
Great Decisions (Pg. 11)	☐	☐	☐	☐

Suggestions For Future Articles:.....

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Comments About This Issue:.....

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Name.....

(Required If You Wish A Reply) **Ext.**.....

☐ Retiree **Division**.....

Mail to: Grumman World, A22-GHQ
1111 Stewart Ave., Bethpage, N.Y. 11714

Data Systems Institute Unveils 1988 Curriculum

Grumman Data Systems Institute is offering the following courses next year:

Computer Programming—January 4.
Computer Operations—January 5.
Computerized Accounting—January 11.
IBM Personal Computer Training—January 11.
Electronics Technology—January 18.
Computer Service Technology—March 7.
Computer-Aided Drafting and Design—March 28.
Systems Analysis—April 18.
Automated Office Technology—September 6.
Court Reporting—September 19.

With the exception of Court Reporting and IBM PC Training, all the courses are covered by the Grumman Tuition Reimbursement Program.

For more information, call the Institute's admissions offices: Nassau Campus, 364-2055; Suffolk Campus, 467-6690.

Looking For A Pad On Long Island?

Looking for a place to live, either to rent or to buy? To help Grummanites cope with the housing crunch on Long Island, Field Administration maintains a file of homes, apartments, co-ops, and condos. Many listings were sent by their owners and will not require paying a realtor's fee.

Homes and apartments to share with other employees are also listed. Grummanites are invited to look through the file. Field Administration is on the first floor of Bethpage's Building 117. Grummanites with properties to sell or rent can send a detailed description, including size and price, to Field Administration, mail stop A05-117, Grumman Corporate Services, Bethpage, N.Y. 11714.

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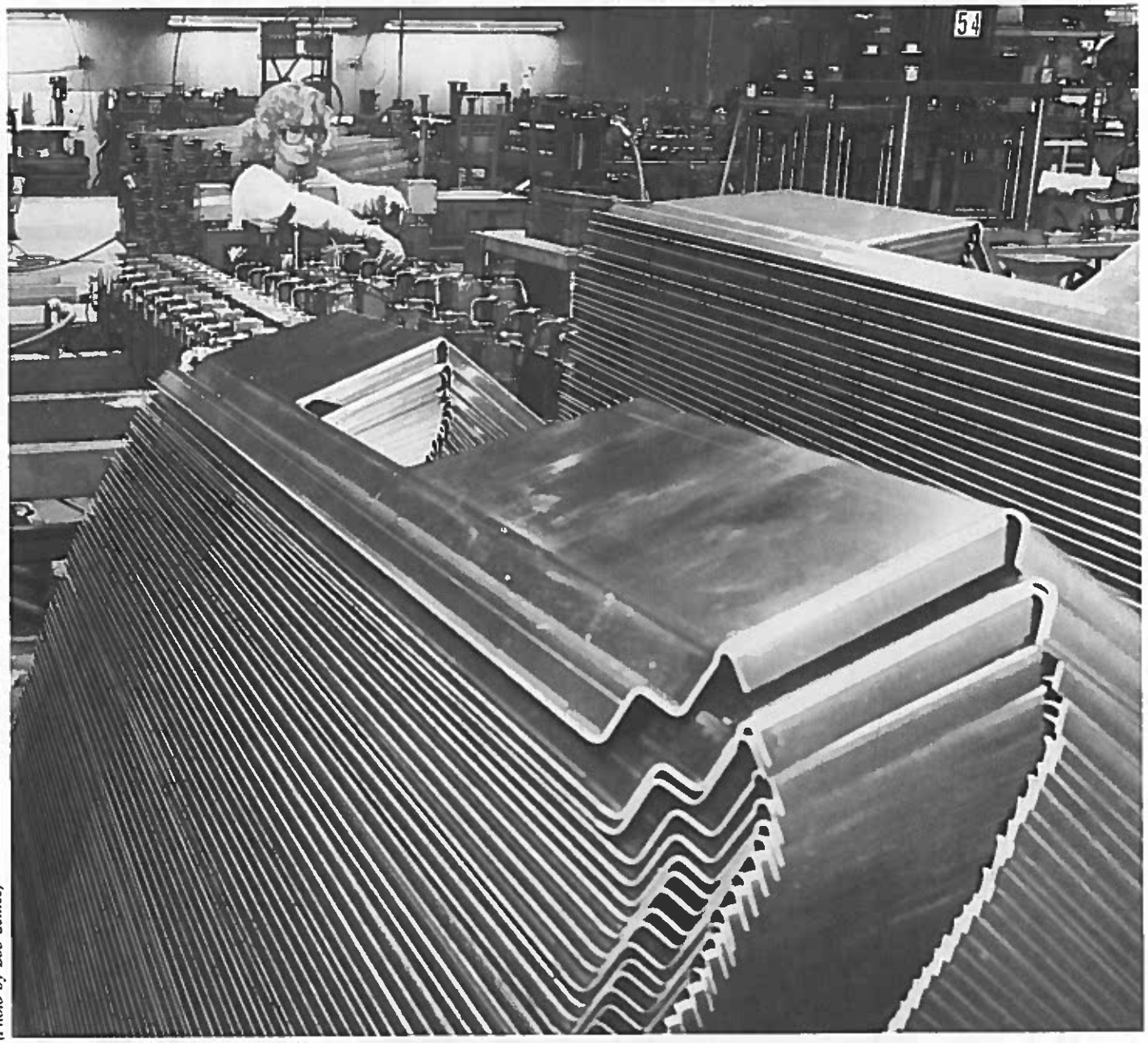

(Photo by Bob Settles)

5,500 Down, 93,650 To Go

Inside Grumman Allied's Montgomery, Pennsylvania, facility, Jayneen Markle produces dash bulkhead panels for the U.S. Postal Service's Long Life Vehicle (LLV).

Over 5,500 LLVs have hit the streets throughout the continental U.S. since Grumman began production this past April. The Grumman Allied Division has a $1.1 billion contract to produce 99,150 of these vehicles for the Postal Service.

Markle operates a hydro-press to make the bulkhead panels, which get shipped to General Motors for installation on the GM S-10 chassis. These are then mated to the Grumman aluminum body.